

## ENERGY FILTER MULTIPLEXING

### ABSTRACT OF THE DISCLOSURE

5           The present invention pertains to a technique of electron spectroscopic imaging  
that is easy to perform and cost effective. This technique allows for spatial resolution  
enhancement of electron beam semiconductor inspection systems (for example a critical  
dimension scanning electron microscope CD-SEM) as well as to obtain useful physical or  
chemical information on the investigated specimen. The technique involves a high pass  
10 energy filter that is alternately set, or multiplexed, at two energies. For an inspected area  
on a specimen, the detected intensity level at the higher energy setting is subtracted from  
the intensity level at the lower energy setting. The obtained differential value  
corresponds to electrons having energy within the range of the first and second filter  
settings. This obtained differential value is used to generate an image of the specimen for  
15 inspection purposes.